

I claim:

1. A method of controlling packet transmission in a power line communication (PLC)-based local area network (LAN) comprising:

providing a PLC control coordinator in the PLC LAN for managing allocation of

5 PLC LAN resources; and

providing, for any packet traversing the PLC LAN, a destination station MAC address, a source station MAC address, and a temporary equipment identifier (TEI) for the transmitting PLC station.

10 2. The method of claim 1 which includes using the ConnectionID in place of a MAC addresses for any packet while the packet is traversing the PLC LAN.

3. The method of claim 1 which includes providing a PLC MAC bridging device for storing information about the source station and the destination station for a connection at the PLC 15 bridge device.

4. The method of claim 3 wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the same PLC LAN.

5. The method of claim 3 wherein a PLC MAC bridge establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridge TEI and destination station 48-bit MAC address are cached in the bridge.

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6. The method of claim 3 wherein a PLC MAC bridge establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridge TEI and destination station 48-bit MAC address are cached in the bridge.

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7. The method of claim 1 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridge.

8. The method of claim 1 which includes bridging packets across the PLC LAN only 15 in PLC bridging devices.

9. The method of claim 1 which includes removing 48-bit MAC addresses of the MAC header for bridged packets.

20 10. The method of claim 9 which includes interworking the bridged packets between the PLC LAN and any non-PLC LAN using the ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN.

11. The method of claim 10 wherein said interworking of packets from a non-PLC LAN by a bridge device includes the re-addressing of the packet by replacing the source 48-bit MAC address and the designation 48-bit MAC address with a ConnectionID, which is contained in the ConnectionID field in the MAC Header.

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12. The method of claim 10 wherein, for packets which are transmitted from the PLC-LAN onto a non-PLC LAN across a bridge device, interworking the packets, including removing the PLC MAC header and forming the LAN MAC header containing the source station 48-bit MAC address and the destination 48-bit MAC address.

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13. The method of claim 1 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

13. A method of controlling packet transmission in a power line communication (PLC)-based local area network (LAN) comprising:

providing a PLC control coordinator in the PLC LAN for managing allocation of PLC LAN resources;

5 providing, for any packet traversing the PLC LAN, a destination station MAC address, a source station MAC address, and a temporary equipment identifier (TEI) for the transmitting PLC station; and

removing 48-bit MAC addresses of the MAC header for bridged packets, and  
interworking the bridged packets between the PLC LAN and any non-PLC LAN using the  
10 ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC  
LAN

14. The method of claim 13 wherein a PLC MAC bridge establishes a connection for  
bridged traffic only when traffic from a non-PLC LAN source station is received for a destination  
15 station on the PLC LAN where the destination station's TEI, bridge TEI and destination station  
48-bit MAC address are cached in the bridge; and wherein a PLC MAC bridge establishes a  
connection for bridged traffic only when traffic from a PLC LAN source station is received for a  
destination station not on the PLC LAN where the bridge TEI and destination station 48-bit MAC  
address are cached in the bridge.

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15. The method of claim 13 which includes providing a PLC MAC bridging device for storing information about the source station and the destination station for a connection at the PLC bridge device, wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the same PLC

5 LAN.

16. The method of claim 13 wherein said interworking of packets from a non-PLC LAN by a bridge device includes the re-addressing of the packet by replacing the source 48-bit MAC address and the designation 48-bit MAC address with a ConnectionID, which is contained in 10 the ConnectionID field in the MAC Header; and wherein, for packets which are transmitted from the PLC-LAN onto a non-PLC LAN across a bridge device, interworking the packets, including removing the PLC MAC header and forming the LAN MAC header containing the source station 48-bit MAC address and the destination 48-bit MAC address.

15 17. The method of claim 13 which includes establishing a unique connection for every 20 pair of stations that cross a PLC MAC bridge.

18 The method of claim 13 which includes bridging packets across the PLC LAN only in PLC bridging devices.

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19. The method of claim 13 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

5 20. The method of claim 13 which includes using the ConnectionID in place of a MAC addresses for any packet while the packet is traversing the PLC LAN.